

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11-3-2010 has been entered.

1. Note that the term "minimum resource parameter" is defined in the specification (Para #24, figures 2-4) as being something that ***might*** represent a minimum number or allocation units OR a minimum number of information bits (eg. a data rate or bandwidth such as a channel's data rate/bandwidth):

[0024]According to preferred embodiments, the minimum resource parameter ***might*** represent either a minimum number of allocation units or a minimum number of information bits for a user or a service in a scheduling frame. According to a variant, the minimum resource parameter represents a minimum ratio of processed information bits to the expended processing and operating power spent for its activity during radio access.

2. As discussed in the examiner's FINAL office action (8-3-2010), he believes novelty is found if the applicant amends* as follows:

Claim 18 + claim 22 + claim 23 + claim 27 + claim 29

**this amdt is different than the one found in the FINAL.*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18, 21-22, 24-30 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Choksi and further in view of Berger and Cansever.

As per **claims 18 and 34**, Choksi teaches a method for performing a scheduling algorithm in a scheduler of a wireless communication system (figure 2 shows a bandwidth allocation controller which reads on a “scheduler”, C4, L17-65), comprising:

obtaining from a communication unit a minimum resource parameter that indicates a minimum number of allocation units to be scheduled for a user or service in a scheduling frame in order to meet a resource constraint of the communication unit (C7, L5-15 teaches a bandwidth request from a mobile unit such as a handoff request, call admission request, an additional bandwidth request or ANY OTHER suitable type Of request for bandwidth for a wireless connection - which reads a request for a minimum resource parameter that indicates a minimum number of allocation units/bits needed – hence this can be a voice channel or data channel which have known minimum rates that are constrained at least by the transceiver hardware), and

scheduling, in the scheduling frame, resources for radio access to the communication unit wherein the resources are scheduled in the allocation units and in accordance with the minimum resource parameter (C7, L16-30 teach whereby the bandwidth is allocated as per the real-time constraints of the cell, eg. congestion, power, available links/bandwidth, etc, see C7, L42-60)

wherein “none/some/all” allocation units are scheduled to the communication unit within the scheduling frame (C7, L5-L60 teaches allocating bandwidth)

but is silent on only if the minimum number of allocation units indicated by the minimum resource parameter can be scheduled for the service or user.

As seen, the applicant's claim puts forth that the request will be (may be?) blocked if the minimum number of allocation units/bits cannot be scheduled. Choksi teaches the bandwidth allocation controller will give whatever amount it can give (eg. none/some/all) depending upon real-time conditions, hence the request will only be "blocked" if no channels/bandwidth is available.

This is clearly a **design choice** since the wireless user is either denied a channel/bandwidth (because the user did not know the amount of bandwidth remaining and their request was over the said amount remaining – which turns into a guessing game) and/or the user is given a channel/bandwidth with perhaps much less than their request and the "service" is poor (eg. the user wants video data at 200kbps but only gets 9.kbps).

The examiner puts forth two different "designs" which either modify the user's requested bandwidth amount OR deny the request altogether:

i. **Berger** teaches a bandwidth request being modified if the request is over the amount of bandwidth currently available (figure 7, #208, #210):

In step 208, the network element 98 determines whether the available rate is less than the requested rate. If not, then the rate encoded in the BCR field 26 of the RM cell 20 is left unchanged in step 214, and the RM cell is transmitted back to the network along the connection in step 212. If the granted rate is less than the requested rate or the presently established rate, then in step 210 the available rate is written over the requested rate in the BCR field 26. Subsequently in step 212, the RM cell 20 having a new BCR field 26 is transmitted back to the network for propagation along the connection. (C7, L55 to C8, L5)

ii. **Cansever** clearly teaches denying the bandwidth request if the amount requested is over the amount available (claim 38):

38. The apparatus of claim 27, wherein the program denies the requested bandwidth if the requested bandwidth is greater than the maximum available bandwidth of the first node.

Hence the examiner notes that one skilled can provide many different ways with which to handle bandwidth requests as based on the real-time availability of the controller's bandwidth.

It would have been obvious to one skilled in the art at the time of the invention to modify Choksi, such that the channel is allocated only if the minimum number of allocation units indicated by the minimum resource parameter can be scheduled for the service or user, to provide means for allocating bandwidth to user only if the amount requested is available.

As per **claims 21**, the combo teaches claim 18, wherein the minimum resource parameter represents a minimum number of information bits per scheduling frame for a user or a service (Choksi teaches determining what amount can be provided based on real-time availability/priority/etc. while Berger/Cansever teaches either modifying the amount requested or denying the request).

Also see previously identified prior art which is now "pertinent but not cited":

"the prior art teaches a standard/typical channel, eg. 9600bps and also changes to the power and data rate, see Hoagland/Klein and Havinga teaches an energy efficient MAC protocol which takes into account the amount of data per frame".

As per **claim 22**, the combo teaches claim 18, **but is silent on** wherein the minimum resource parameter represents a minimum ratio of a number of information bits processed by the communication unit in a scheduling frame to an expended processing and operating power spent during the radio access by the communication unit in said scheduling frame.

Choksi teaches power control is required to prevent damage to the BTS's transmitter (eg. power levels do not exceed maximums), hence the claim language is

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interpreted as meaning "taking into account the bandwidth request in relation to the amount of power that will be needed to support that link"). Hence if the system determines a high level of power is required and that this power level will exceed the BTS's maximum power transmission level, then it will be denied.

Momona teaches a system whereby the (mobile) station makes a bandwidth/channel request that includes both the TYPE and AMOUNT of data to be transmitted (see claim 7).

Holtzman – *pertinent but not cited* -- teaches determining the previously used and predicted power requirements to transmit data to the mobiles, see figure 4, which reads on determining operating power "spent/used" during the transmission and if it is available as based on an "efficiency threshold" since the data rate will be modified if the power requirement/threshold is exceeded, see figure 5 steps 542-546.

Hence Choksi (and/or Holtzman) both understand/process the bandwidth requested in relation to power control and Momona puts forth how much data will be sent. Together, the BTS can determine if the bandwidth is available and for how long the transmitter's power will be needed to transmit the "amount of data" specified, which reads on the minimum resource parameter correlating the information bits processed to an operating power spent during the communications.

It would have been obvious to one skilled in the art at the time of the invention to modify the combo, such that the minimum resource parameter represents a minimum ratio of a number of information bits processed by the communication unit in a scheduling frame to an expended processing and operating power spent during the radio access by the communication unit in said scheduling frame, to provide means for understanding the power level required to send a specified amount of data on a specified channel to prevent damage to the BTS.

As per **claims 24-25**, the combo teaches claim 18, wherein the minimum resource parameter is signaled periodically from the communication unit to the scheduler OR from a request by the scheduler (Choksi teaches communicating with various mobile units who may make requests from time-to-time and even during an on-going call, eg. he teaches a request for additional bandwidth and/or handoff, which reads on the claim -- C7, L5-15 teaches a bandwidth request from a mobile unit such as a handoff request, call admission request, an additional bandwidth request or ANY OTHER suitable type Of request for bandwidth for a wireless connection).

As per **claim 26**, the combo teaches claim 18, **but is silent on** wherein the signaling of the minimum resource parameter is initiated by the communication unit upon fulfillment of power management conditions.

The claim is given a broad/reasonable interpretation such that “fulfillment of power management conditions” means that the mobile is instructed/commanded by the BTS to set its power to a certain level and then commence with data transmission.

a. Power control is well known in the art and can be either closed-loop or open-loop control (eg. mobile feedback or no feedback).

b. Choksi teaches understanding of power control functions so as not to exceed maximum power of the transmitter and damage it (C1, L24-40).

b. Klein – pertinent but not cited - clearly teaches the BTS sending power instructions to the mobile so that an optimal power level is set (eg. either before or during voice/data transmission), see at least claims 2-3 and 5.

It would have been obvious to one skilled in the art at the time of the invention to modify the combo, such that the signaling of the minimum resource parameter is initiated by the communication unit upon fulfillment of power management conditions, to provide means for the mobile to first comply with the BTS's power command before transmitting (so as not to inject interference into the network if the mobile's power is too high).

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As per **claim 27**, the combo teaches claim 18, wherein the scheduling step includes considering in addition at least one of the following scheduling parameters channel condition, amount of data available for transmission, quality of service, delay, data rate and carrier to interference ratio (the prior art teaches determining channel conditions, type or amount of data (eg. voice, video), QoS since voice/video have different requirements, interference conditions/SNR, etc.. Choksi clearly teaches Qos, C1, L60 to C2, L34, Class of Service such as Premium/Assured/Best Effort and the ability to use both in processing a request, Fgiure 3, #161, 162, 164, 166).

As per **claim 28**, the combo teaches claim 18, wherein the scheduling frame has at least one of a time division, frequency division or code division frame structure (the prior art teach various cellular protocols, including at least FDMA and CDMA, see Choksi, C3, L32-42)

As per **claim 29**, the combo teaches claim 18, wherein the allocation units have a quantity of either one of transmittable information bits, internet protocol packets, code blocks or modulation symbols (the prior art teach at least “data rates” which infer information bits – eg. bits per second – and Choksi teaches frames, packets, cells, datagrams and TCP/IP, C3, L32-61).

As per **claim 30**, the combo teaches claim 18, wherein the minimum resource parameter is signaled by the communication unit on a separate control channel associated to the data channel over which the allocation units are transmitted (the use of a CONTROL CHANNEL is well known and taught by Holtzman*, C5, L32-35, and would be used to provide control to the mobile. Similarly the “control data” could also be embedded in the user data in a user’s dedicated voice/data channel. Berger teaches “control data” being transmitted/processed, C7, L5-22).

**pertinent but not cited*

Claim 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Choksi, Berger, Canserver and further in view of {Klein or Holtzman}.

As per **claim 23**, the combo teaches claim 18, **but is silent on** wherein the minimum resource parameter represents a sufficient quantity to exceed a power efficiency threshold in a scheduling frame.

Choksi/Berger/Canserver combine to teach determining a channel bandwidth to be allocated and scheduling of the transmission (to optimize the cell's communication in relation to all currently supported users).

Also see Klein or Holtzman:

Klein teaches using a gain threshold and power level, which reads on the claim.

Similarly Holtzman teaches determining the previously used and predicted power requirements to transmit data to the mobiles, see figure 4, which reads on determining if the power is available as based on an "efficiency threshold" since the data rate will be modified if the power requirement/threshold is exceeded, see figure 5 steps 542-546).

It would have been obvious to one skilled in the art at the time of the invention to modify the combo, such that wherein the minimum resource parameter represents a sufficient quantity to exceed a power efficiency threshold in a scheduling frame, to provide means for the scheduling of the bandwidth/channel to provide optimal system performance in relation to the requested amount of bandwidth, the transmit power and the time/scheduling of the transmission.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 571-272-7862. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinsong Hu can be reached on 571-272-3965. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Stephen M. D'Agosta/

Primary Examiner, Art Unit 2617